Meeting Notes
Wyckoff Eagle Harbor – OU1
October 27, 2015

Participants:
Helen Bottcher, EPA
Justine Barton, EPA
Scott McKinley, CH2M (on behalf of EPA)
Rich Brooks, Suquamish Tribe
Susannah Edwards, Washington Department of Ecology
Chung Yee, Washington Department of Ecology

The participants met at EPA's office in Seattle to discuss three topics related to the offshore (OU-1) portion of the Wyckoff Eagle Harbor site. Key topics covered were:

1. Cleanup area boundaries for OU1 – what areas should be treated with thin inset caps and why
2. Areas to be refined with further sampling during the pre-design phase
3. Long-term monitoring plan (post construction)

Cleanup area boundaries
Participants discussed the cleanup area boundaries, using an Excel table summarizing the TarGOST log readings and a map, Figure 4-2 from the Field Investigation Report. These documents were shared with the group before the meeting. The team discussed each TarGOST log where there was some doubt as to whether the area should be treated with thin inset capping. The raw TarGOST log results, along with the duplicate log and confirmatory sediment core sample (where available) were considered. The team also reviewed the waveform data presented in Appendix B-2 of the OU-1 Field Investigation Report. Appendix B-2 was used to confirm that %RE readings at the sediment surface at several of the TarGOST locations were likely due to algae rather than PAH contamination. Team members also considered other lines of evidence, including persistent NAPL seeps locations and sediment samples from the 2011 sampling event.

The team agreed which TarGOST locations should be treated with thin layer capping. The attached spreadsheet summarizes the decisions reached for each TarGOST probe location. The resulting cleanup areas are shown on the attached map. The areas targeted for capping are smaller than presented in the draft FFS, which will reduce the cost of the remedy and minimize the impact to the existing beaches and eelgrass beds.

In reaching these decisions, the group agreed to a number of decision guidelines. These decision guidelines should also be applied to new TarGOST data that will be collected as part of the pre-design sampling effort. They are guidelines, not hard and fast rules – judgment is needed to weigh and balance the factors listed below.

- Areas with TarGOST readings of 50% RE or higher in the top three feet of sediment should be capped.
- Regardless of the TarGOST results, if a co-located confirmatory sediment core sample contains NAPL or oil coated sediment in the top three feet, the area should be capped.
- Areas with significant NAPL contamination below three feet should be capped because they could be a source of contamination to the cleaner layers above them. Capping will reduce

contaminant transport to the cleaner layers near the surface though the use of amended layers at the base of the cap. To define "significant NAPL contamination," the group considered the depth of the NAPL, the thickness of the NAPL layer and the %RE. NAPL that occurs only at 10 feet below the surface and deeper does not need to be capped. NAPL that occurs at depths between 3 and 5 feet below the surface should be capped if the %RE is high (>100), or it is thick (a foot thick or more). NAPL that occurs at depths between 5 and 10 feet below the surface should be capped if it is thick (a foot thick or more) AND has a high %RE (>150).

- Areas with persistent seeps at the surface should be capped, regardless of the TarGOST data nearby.
- The likelihood of human exposure should be considered. On the East Beach, the area exposed on most days (except during unusually low tides) is a fairly narrow strip next to the sheet pile wall. This factor was used to move some "borderline" stations (for example, with %RE just barely below 50 in the top three feet) into the cleanup area boundary.

Areas for further refinement

Participants agreed that further refinement is not needed on East Beach, where clean samples outside the proposed cleanup areas provide a clear and well justified boundary. The group identified three areas in North Shoal that would benefit from additional TarGOST borings to help define the areas to be capped. These areas are shown on the attached map.

Long Term Monitoring

Post-construction monitoring will take place in three distinct phases:

- Post Construction Confirmation Sampling
- Monitored Natural Recovery (MNR) – this period would span the timeframe from construction completion until achievement of RAOs. Per meeting discussions, this period is assumed to be 10 years for remedial action alternative cost estimating.
- Long-term O&M – this period occurs after RAOs are achieved and would be a State Lead activity.

The means and methods that will be used for long-term monitoring will be similar to that described in the Year 17 report and will likely include visual surveys, beach topographical surveys, grain size sampling, off-cap sediment sampling, and on-cap and off-cap clam tissue.

Post-construction sampling will establish the post-construction baseline conditions, against which future sampling results will be compared. It will also establish surveyed elevations across the capped areas and set survey markers for future assessment of the physical stability of the beach. It will include sampling and analysis of sediments in MNR areas (i.e., non-capped areas) and collection of clams from MNR areas. Newly capped areas will not be sampled for sediment or clam tissue. In calculating the average sediment concentrations of contaminants on the beaches, the concentrations from a composite sample of the backfill source material will be used for the capped areas.

Rich asked about the area over which beach sediment data would be averaged and expressed a preference for separating West Beach from the North Shoal / East Beach area. Sampling and data evaluation specifics will be presented in a revision to the OMMP.

Scott suggested that the beaches be re-surveyed (with no sampling) following the first large storm and then at years 1, 2, and possibly 3 to ensure the newly capped areas are not experiencing unacceptable erosion.

During an assumed 10 year period of MNR following construction, sampling should occur in years 3, 6 and 9. Clam sampling should begin in Year 6 – this will allow time for clam to establish in the capped areas and grow to legal size for collection. Scott noted this timing may need to be adjusted to better align with the 5 Year Review schedule, however, for the purposes of the draft final FFS, this timeframe will be used for cost estimating.

Once RAOs have been achieved, monitoring will shift into a longer-term O&M period, with sampling every five years to inform the Five Year Review. Sampling during this phase should be less intense and tiered. For example, surveying to ensure physical stability and clam tissue monitoring may be sufficient. If the clams show increasing contaminant levels, follow up sampling of sediment and/or pore water could be conducted to help tease out the source / pathway of contamination observed in the clams.

The group agreed that TarGOST sampling may not be needed in the OMMP. The planned sediment sampling (both surface and top 2 foot composite samples), clam sampling, and physical condition surveys should be adequate. TarGOST could be helpful if NAPL seeps reappear, or if clam tissue concentrations increase over time.

Other / Miscellaneous Topics

The assumed cap replacement rate in the draft FFS is 50% of the caps, over 50 years – 10% every 10 years. The group briefly discussed this assumption, which was thought to be conservative, especially on the North Shoal which is more sheltered and less prone to erosion than East Beach. For North Shoal, the group agreed 25% replacement at year 9. On East Beach, the assumption in the draft final FFS will be 50% with 25% replacement occurring in year 9 and 25% in Year 30.

Potential impacts of the new outfall pipe that will drain water from the surface of the upland (OU-2 / OU-4) cap remains a significant concern to the Suquamish Tribe. Rich wants to meet with DNR to hear their views on this issue prior to consulting on a Government-to-Government basis on the draft Proposed Plan. Helen noted that she will need CH2M help to prepare for this meeting (detailed figure of outfall, volume calculations, maybe a mixing zone model).

Rich would like to discuss adding Varnish clams to the sampling program.

Rich would like the cap design to include some sort of demarcation layer, similar to the porous geotextile and cobble layer used at the base of the EBS on West Beach. CH2M will determine if a porous geotextile and cobble layer can be added to the modified thin inset cap design.

Follow-up / To Do Items:

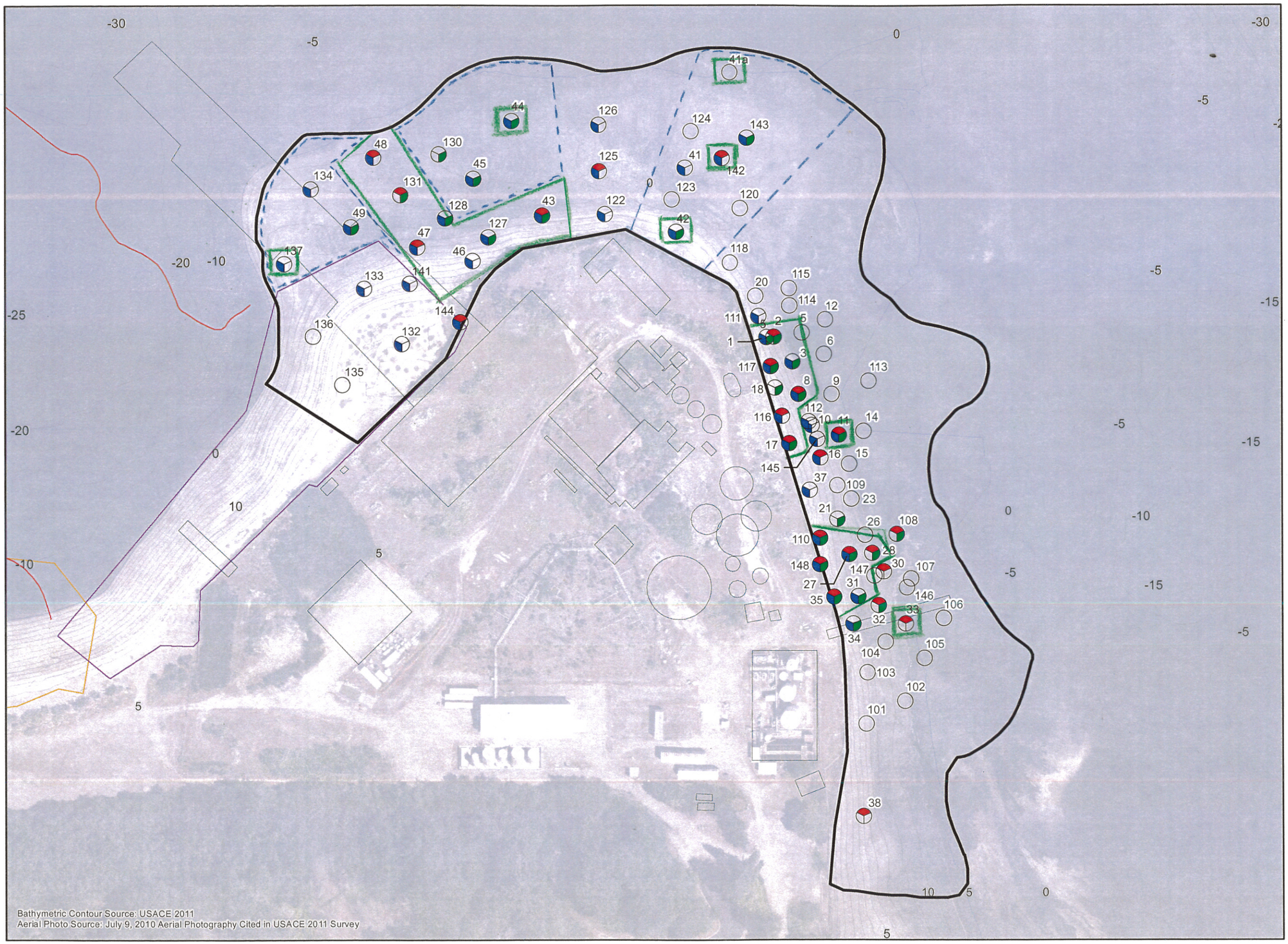
- Helen will draft meeting notes
- Helen will clean up and send out the table of TarGOST logs and the map
- Rich will contact DNR staff to discuss the outfall and work with Helen to set up a meeting
- Scott will revise the draft FFS to reflect the outcomes of this discussion

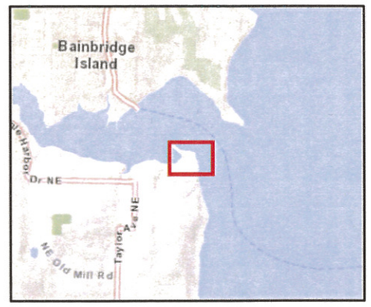
Area	LOG #	Include in capping area?	Rationale, per Oct 27 Team Meeting
North Shoal	135	NO	Clean
North Shoal	136	NO	Clean
North Shoal	137	YES	Assume patch over this area for now. Use TarGOST during pre-design sampling to refine capping area around this location.
North Shoal	132	NO	Clean
North Shoal	133	NO	NAPL is very deep
North Shoal	144	NO	Clean
North Shoal	141	NO	NAPL is deep
North Shoal	49	NO	Do not include in cap footrprint for now; contamination here is deep. Re-evaluate this station during pre-design
North Shoal	134	NO	NAPL is deep. Do include this area in pre-design sampling
North Shoal	46	YES	Thickness of NAPL and high %RE suggest subsurface NAPL could be source to surface sediments
North Shoal	47	YES	NAPL with %RE > 50 in top 3', also high %RE in deeper layers could act as source
North Shoal	128	NO	Clean - "hit" previously identified at surface is algae
North Shoal	131	YES	NAPL identified in top sections of core sample
North Shoal	48	YES	%RE >100 in top three feet, sediment in nearby surface sample (YR 17 report) failed ROD criteria
North Shoal	127	YES	Very high %RE in subsurface suggests NAPL could be a source to surface sediments
North Shoal	45	NO	Clean - "hit" previously identified at surface is algae
North Shoal	130	NO	Clean
North Shoal	43	YES	Thickness of NAPL and high %RE suggest subsurface NAPL could be source to surface sediments
North Shoal	44	YES	Assume patch over this area for now. Use TarGOST during pre-design sampling to refine capping area around this location. There is NAPL > 50%RE at ~2.5 feet, higer RE at depth, and the station is near a seep.
North Shoal	122	NO	Clean
North Shoal	125	NO	RE is barely above 50% threshold and nearby samples are clean
North Shoal	126	NO	NAPL is very deep

Area	LOG #	Include in capping area?	Rationale, per Oct 27 Team Meeting
North Shoal	42	YES	Although TarGOST logs did not indicate NAPL, sediment core had oil coated / heavy sheen in top 3' - Cap with patch or as part of larger area to be refined during pre-design sampling - same note as 142
North Shoal	123	NO	Clean
North Shoal	41	NO	Clean
North Shoal	124	NO	Clean - "hit" previously identified at surface is algae
North Shoal	41a	Maybe	Close to "icky hole" with NAPL found during 2014 clam sampling. May not be possible to install cap this far out, but assume a patch here for now, refine in pre-design sampling / design.
North Shoal	142	YES	Cap with patch or as part of larger area to be refined during pre-design sampling
North Shoal	143	NO	Clean
North Shoal	118	NO	Clean
North Shoal	120	NO	Clean
EB - South	38	NO	Clean - "hit" previously identified at surface is algae
EB-South	101	NO	Clean - "hit" previously identified at surface is algae
EB-South	102	NO	Clean - "hit" previously identified at surface is algae
EB-South	103	NO	Clean
EB-South	105	NO	Clean - "hit" previously identified at surface is algae
EB-South	104	NO	Clean - "hit" previously identified at surface is algae
EB-South	33	YES	Use patch over this area
EB-South	106	NO	Clean
EB-South	34	NO	NAPL is deep
EB-South	32	NO	Thin layer at surface is algae; deeper NAPL has low %RE
EB-South	146	NO	Clean - "hit" previously identified at surface is algae
EB-South	107	NO	Clean - "hit" previously identified at surface is algae
EB-South	35	YES	Thickness of NAPL in deeper layers with high %RE, also this is just west of a persistent seep
EB-South	31	YES	Near persistent seep, and will be inside polygon defined by other samples anyway
EB-South	147	NO	Clean - "hit" previously identified at surface is algae
EB-South	30	NO	TarGOST log here is clean.

Area	LOG #	Include in capping area?	Rationale, per Oct 27 Team Meeting
EB-South	148	YES	High %RE (>100) in top 2 feet
EB-South	27	YES	Very high %RE in subsurface suggests NAPL could be a source to surface sediments
EB-South	28	YES	High % RE just below 3', also this is near subsurface sample N11-B5 that had ROD exceedance in YR 17 sampling event
EB-South	26	NO	Clean
EB-South	108	NO	Clean - "hit" previously identified at surface is algae
EB-South	110	YES	Thickness of NAPL and high %RE suggest subsurface NAPL could be source to surface sediments. Also, location is near wall, where there is higher chance of human exposure
EB-South	21	NO	NAPL is below 3', layer is thin and %RE is relatively low (<100)
EB-South	23	NO	Clean
EB-North	37	NO	Clean
EB-North	109	NO	Clean
EB-North	15	NO	Clean
EB-North	16	NO	Clean - "hit" previously identified at surface is algae
EB-North	11	YES	Thickness of NAPL and high %RE suggest subsurface NAPL could be source to surface sediments - patch here rather than include in polygon
EB-North	14	NO	Clean - "hit" previously identified at surface is algae
EB-North	17	YES	Core log noted heavy sheen and oil coated material at depth (5') and location is near sheet pile wall (Helen added after meeting)
EB-North	145	NO	Clean - "hit" previously identified at surface is algae
EB-North	112	NO	NAPL is very deep
EB-North	10	NO	"hit" at surface is algae, NAPL is deep, in thin layer, with relatively weak RE signal (<60%)
EB-North	9	NO	Clean - "hit" previously identified at surface is algae
EB-North	113	NO	Clean - "hit" previously identified at surface is algae
EB-North	116	YES	Will pick up along with station 17;and near wall where human exposure is more likely
EB-North	8	YES	Thickness of NAPL and high %RE suggest subsurface NAPL could be source to surface sediments, also close to persistent NAPL seep
EB-North	18	NO	But will pick up in polygon anyway

Area	LOG #	Include in capping area?	Rationale, per Oct 27 Team Meeting
EB-North	117	YES	%RE is realtively low, but include this in polygon due to proximity to sheet pile wall
EB-North	3	YES	High %RE near surface
EB-North	6	NO	Clean - "hit" previously identified at surface is algae
EB-North	1	YES	High %RE below 5'
EB-North	2	YES	NAPL with %RE > 50 in top 3', also high %RE in deeper layers could act as source
EB-North	5	NO	Clean - "hit" previously identified at surface is algae
EB-North	12	NO	Clean - "hit" previously identified at surface is algae
EB-North	111	NO	NAPL is deep and %RE is low (<50)
EB-North	114	NO	Clean - "hit" previously identified at surface is algae
EB-North	20	NO	Clean
EB-North	115	NO	Clean - "hit" previously identified at surface is algae





Wyckoff OU-1 Focused Feasibility Study Project Area

General TarGOST Response Depths

- No Detection
- 0 to 3 Feet
- 3 to 5 Feet
- > 5 Feet

□ = cleanup areas

▭ = additional TarGOST during pre-design to refine

Historical Features (Locations are approximate)

2000 Phase II Cap Boundary

2001 Phase III Cap Boundary

Exposure Barrier System

N

0 50 100 200 Feet

Figure 4-2
Depth Intervals of TarGOST Detections
Wyckoff OU-1 Focused Feasibility Study

EPA

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